

Deepak Kumar

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Working Experience

2025 – Now **Indian Institute of Technology, Roorkee, INDIA**
Department/Centre: Institute Instrumentation Centre
Designation: Junior Technical Superintendent

Education

2019 – 2024 **Indian Institute of Science Education and Research, Mohali, INDIA**
Five-year BS-MS Dual Degree Programme : Chemistry (Major), Earth-Science (Minor)
CPI: 8.8/10

Achievements and Scholarships

2024 Awarded Best Poster Presentation at the International Conference on '**Emerging Trends in Photodynamics and Photochemistry**' (ETPP-2024) at IISER Mohali
2020 – 2024 Merit cum means Scholarship holder in **IISER Mohali**
2019 Qualified **IIT-JEE Advanced**
2018 & 2019 Qualified JEE Mains
2013 Qualified National-level Science Talent Search Examination (**NSTSE**)

Work History

2023 – 2024 **BS-MS Project (May 2023 - June 2024)**
Indian Institute of Science Education and Research, Mohali, INDIA
Supervisor: Dr. Sugumar Venkatramani (Associate Professor)
(i) **Project:** Matrix isolation infrared spectroscopic and computational studies of azido derivatives of azoheteroarenes
» *In this project, we synthesized meta- and para-azido derivatives of azoheteroarenes that can undergo E-Z photo-switching and nitrenes/azirines formation upon UV irradiation. Our aim was to investigate their photochemistry under UV irradiation using matrix isolation setup and to complement our findings with computations based on DFT calculations, which provided insight into their potential reaction pathways.*
2022 **Summer Internship (May 2022 - August 2022)**
National Institute of Hydrology, Roorkee, INDIA
Supervisor: Dr. Mukesh Sharma (Scientist-'G')

- (i) **Project:** Groundwater quality assessment of Roorkee City, India, focusing on heavy metal contamination and Ganga Canal water contribution.

» *This comprehensive study involved the systematic examination of groundwater quality in Roorkee, Uttarakhand, in the face of rapid urbanization and industrial development. Groundwater samples were collected citywide and analyzed for water quality, bacterial contamination and stable isotopic traces. Additionally, the study assessed heavy metal contamination in groundwater, evaluating human health risks through indices like the Heavy Metal Pollution Index (HPI) and Degree of Contamination (Cd), while utilizing statistical tools such as PCA and hierarchical cluster analysis to identify contamination sources. The research also investigated groundwater recharge sources using isotopic signatures, with a focus on the role of the Upper Ganga Canal in influencing local aquifers.*

2021 Summer Reading Project

Indian Institute of Science Education and Research, Mohali, INDIA

Supervisor: Dr. Ujjal K. Gautam (Associate Professor)

- (i) **Project:** Artificial Photosynthesis (Water Splitting)

Research Skills

Analytical/Instrument Skills	Software Skills
UV-Vis Spectrophotometer	ArcGIS 10.3
FTIR Spectrophotometer	QGIS 3.2
Matrix Isolation Spectroscopy	Gaussian 16
Ion chromatography	MestReNova 12
ICPMS/MS	LaTeX (Overleaf)
MPAES	ChemDraw 15
MALDI-TOF/TOF	Flex Analysis
Flame photometer	XLSTAT 22
3D Printer	CAD Softwares

Conferences

- 2024 Participated in the International Conference of '**Emerging Trends in Photo-dynamics and Photochemistry**' (ETPP-2024) at IISER Mohali
- 2025 Attended '**10th International Groundwater Conference**' (IGWC-2025) at NIH Roorkee

Publications

- (i) Sharma, M.K., **Kumar, D.**, Gehlot, V. *et al.* Assessment of heavy metals in groundwater and their potential health risks: case study of Roorkee City, India. *Int J Energ Water Res* 9, 2439–2460 (2025). <https://doi.org/10.1007/s42108-025-00399-z>
- (ii) "Matrix isolation infrared spectroscopic and computational studies of azido derivatives of azoheteroarenes". (*Manuscript under preparation*)